

QST 

# CANADA

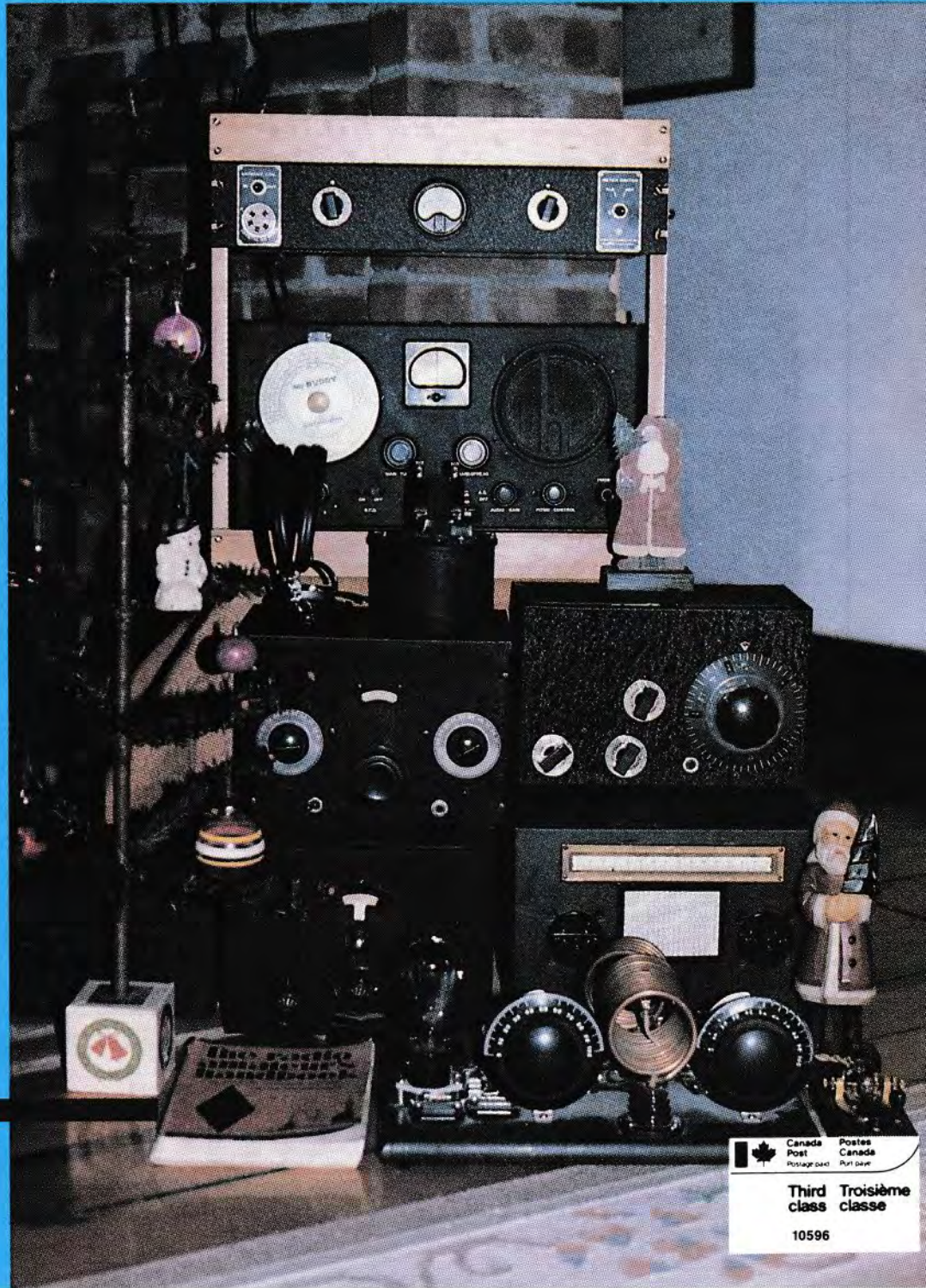
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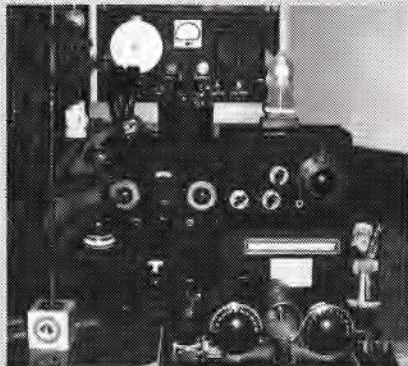
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## ABOUT THE COVER



Amateurs 50-60 years ago might have looked for these under their Christmas trees. Can you identify the National SW-3, FB7X, and 1-10, the *Gross Eagle*, the Hallicrafters *Sky Buddy*, the Millen exciter, and the 1929 Hartley TX? ■

# It Seems to Us... /Il nous semble...

## Nostalgia

Quick! How many controls are there on the front panel of a TS-940S?

The Kenwood engineer at this year's "Dayton Hamvention" couldn't tell us, and you probably don't know either, but you'd probably agree that there are lots.

That's the way Amateur Radio has been headed for many years now. More and more complex. So complex that most of us can't even service the equipment we use. We have to send it out for repair!

Lately, however, another trend has been setting in. While many of us still yearn for rigs with the latest bells and whistles, some of us are saying, "Enough! We just want a rig with a few simple controls. After all, we just want to talk to people!" Many manufacturers are now supplying such rigs.

**It Seems...** continued on page 20  
**Canadian Stations** continued on page 17

December, 1923

QST

49



# Amateur Radio Stations



## Some Prominent Canadian Stations



### 9BP, PRINCE RUPERT, B. C.

Everyone will recall 9BP as being the station that has maintained regular working schedules with WNP for the past two months while the "Bowdoin" lies frozen in the ice, 2000 miles to the northwest of Prince Rupert. To better fix 9BP's location in your mind, Prince Rupert is the western terminus of the Canadian National Railways and is situated on the coast 500 miles north of Vancouver, B. C.

Jack Barnsley, the owner and operator, reservedly assures us that 9BP is not a wonder station. It's many good DX records speak for themselves, however. The best transmission, prior to working WNP, was to Canadian 3NI, Ft. Williams, Ont. Mr. Barnsley also has a card from Ithaca, N. Y., reporting his signals and has worked stations as far south as (ZH, near the Mexican border. 9BP has been the western terminus for several all-Canadian trans-continental relay tests and it was on one of these occasions that a message was sent from Prince Rupert at midnight and an answer received back from Toronto in six minutes! Being the only relay station for many hundreds of miles around, 9BP is due to become a

strong link in future relay routes to Alaska.

The transmitter will be recognized as being a duplicate of 6ZAC's old transmitter that was described in the May, 1922, issue of *Radio*. Two 50-watt tubes are



Jack Barnsley

used in a full-wave rectification circuit with 1500 volts on the plates. The reversed feedback circuit is used instead of the Hartley circuit employed in 6ZAC's transmitter. The present antenna current is only three amperes but efforts are be-



All letters will be considered carefully. Letters are edited and may be condensed in order to have more information and readers' views presented. The publishers of *QST Canada* assume no responsibility for statements made by correspondents.

## THE XYL

☐ *The following was received by Garry Hammond, VE3XN, in response to his column in 1989 October QST Canada.*

I too am an XYL with three roles to play...

First, as "wife" with all the regular duties plus a full-time job. Meals and sleep are often interrupted or late because I am net control, I have traffic to handle, I'm speaking to a public service organization about emergency communications, training ECs, going to or speaking at a radio club meeting, giving exams, or just plain being on the air!

My second role as hostess is to have eyeballs with amateurs I have met on the air, to host training sessions, to provide encouragement to prospective amateurs, to compare notes with fellow amateurs on

QRP wire antennas, emergency communications, net operations, DXing, new equipment, old equipment, and more.

My third role is as an *amateur*. I am net manager and net control, a Section Emergency Coordinator and a volunteer examiner. I'd likely be on the air any hour of day or night. I like to think that someday I'll have the time to build my own linear amplifier and, maybe just for fun, a spark transmitter. It has taken me a few years, but I have passed the seven exams necessary to obtain my Extra Class license—the highest in the US.

Mrs Munroe may be content as an XYL and "unofficial ham", but I prefer to be known as KA8UVQ! —*Sally J Dawson, KA8UVQ/VE1, Shelburne, Nova Scotia*

☐ I was pleased to read "The XYL" in

October *QST Canada*. This past July, my wife, my daughter and I were recipients of Mamie Munroe's hospitality in Hay River, NWT. I had been talking to Stu on the Hay River repeater when he invited us over for a cup of tea.

When we got to VE8CM, Stu was in the shack on a long-distance phone call, so we waited upstairs in the kitchen. In walked Mamie, arriving home from work. "You must be a ham radio operator," she said, fully accustomed to finding vehicles with antennas on them in her driveway, and strangers in her kitchen. Well, the cup of tea turned into supper with the Munroe family, and a thoroughly enjoyable visit.

Thanks again, Mamie, and the three of us certainly enjoyed your article. —*Carl, VE1UU, XYL Kathy and Abby Anderson, Dartmouth, Nova Scotia.*

## NO ONTARIO 220-MHz GRAB

*The following was received by David Wessel, VE3LMU, President, Amateur Radio Society of Dryden, in response to an inquiry about a report that the Ontario government was interested in the 220-MHz band:*

I am writing in response to your letter regarding the possible loss of radio spectrum available to Amateur Radio. As Ontario has no authority with respect to allocation of the radio spectrum, I am unaware of the issue to which you refer. Further, staff of my ministry have consulted with the federal Department of Communications, which is responsible for such matters, and have found no immediate proposals or plans to make changes to the 220-MHz radio band.

I thank your members for their continued service to the community, and wish them continued success in the future. —*Lily Munroe, Culture and Communications Minister, Province of Ontario* ■

### The Canadian Radio Relay League, Inc La Ligue Canadienne de la Radio Amateur, Inc



The Canadian Radio Relay League (CRRL) is a noncommercial association of radio amateurs organized for the promotion of Amateur Radio communications and experimentation, for the establishment of networks to provide communications in the event of disasters or other emergencies, for the advancement of the radio art and the public welfare, for the representation of radio amateurs in legislative and other matters, and for the maintenance of fraternalism and a high standard of conduct.

CRRL is incorporated under the Canada Corporations Act. Its affairs are governed by a seven-member Board of Directors elected every two years by the CRRL general membership. CRRL is noncommercial, and no one who could gain financially by the shaping of its affairs is eligible for membership on its Board.

CRRL is the Canadian member-society of the International Amateur Radio Union (IARU). "Of, by and for the Canadian Radio Amateur", CRRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement in amateur affairs.

A bona fide interest in Amateur Radio is the only essential requirement for membership. An Amateur Radio licence is not required, although full voting membership is granted only to licensed amateurs in Canada.

Membership inquiries and general correspondence should be directed to CRRL Headquarters, Box 7009, Station E, London, ON N5Y 4J9 (519) 860-1200.

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## Calendar



**Attention:** Deadline for items is the 1st of the second month preceding the month of publication. For example, information would have to reach *QST Canada* by January 1 to be included in a March issue.

**Canada Winter Contest:** 0000-2400 UTC, Saturday, December 17. Sponsored by the Canadian Amateur Radio Federation (CARF). Object of contest: to work as many stations—particularly Canadian stations—as possible in a 24-hour period. Scoring: 20 points for contacts with CARF stations using TCAVCA call signs, 10 points for other Canadian contacts, and 4 points for US or DX contacts. Multipliers: each province or territory on each band and each mode. Send copy of log to Jeff Parsons, VE6CB, R. R. 1, Oxford Mills, ON K0G 1S0. ■



# A 50-Ohm Noise Bridge for Antenna Tuners

No need to QRM. Tune up *before* going on the air!

By Kevin Denike, VE6HA  
Box 674  
Cochrane, AB T0L 0W0

Here is an interesting project that is less expensive than an automatic antenna tuner and almost as easy to operate! It will help you adjust your antenna tuner so it presents a 50-ohm load to your transmitter—and do it a lot easier and faster than using an SWR meter. It can also be used to measure the resonant frequency of your antenna—a great help when you are first setting up.

## Concept

This project is a combination of the Palomar "Tuner Tuner" and the ARRL "Impedance Bridge". An internally generated wideband RF signal ("noise") is introduced into two arms of a modified Wheatstone bridge through a toroidal transformer. One arm has a 50-ohm fixed reference resistor in it, and the other arm is connected to the antenna system via the antenna tuner. The receiver antenna input (or input/output of a transceiver) is connected between the arms of the bridge. As long as the arms have a different impedance, the wideband RF signal will be detected by the receiver and the S-meter will deflect. When the arms have the same impedance (50 ohms), the RF signal from the bridge will disappear.

## Operation

The bridge is placed in the antenna line between the receiver (or transceiver) and the antenna tuner. To operate, simply turn on the bridge and adjust the antenna tuner until the receiver S-meter dips and the noise level is at a minimum. Turn off the bridge and get ready to transmit. You now have the lowest possible SWR without ever having put a signal on the air.

If you want to find the resonant frequency of an antenna, connect the antenna directly to the bridge. Turn on the bridge and tune your receiver up and down the band. The S-meter will dip at the antenna's resonant frequency.

## Circuit Description

U1 and associated components generate a 1000-Hz signal voltage that is applied to Zener diode D1. D1 then produces a wideband RF signal (noise) that is amplified by Q1 and Q2, and introduced into the primary of T1 (1,6). T1 secondary (2,4) and the

50-ohm reference resistor (R9 and R10 in parallel) form one arm of the bridge circuit. T1 secondary (3,5) connects to the tuner and antenna to form the second arm of the bridge. When both arms have equal impedance (as a result of adjusting the antenna tuner), no RF signal ("noise") flows from the centre of the secondaries (2,5) to the receiver. Switch S1a-c turns off the bridge and disconnects it from the antenna system so you can transmit. F1 is a safety precaution. It will protect your bridge if you inadvertently transmit without turning the bridge off.

## Construction Notes

The bridge can be built into your rig or antenna tuner, or in a stand-alone cabinet. Switch S1a-c forms part of the transmission line on transmit, so it must be capable of handling the power output of your rig. Wiring between the switch and antenna connectors J1 and J2 must be short and direct, #18 or heavier.

## Circuit Board

Carving copper islands on the foil side of a circuit board is much quicker than etching, particularly when only one board is required. Tape the layout (Fig 3) of the foil side onto the copper foil—with a piece of carbon paper sandwiched between the layout and the foil. Centre punch all hole marks through the layout and onto the board. Trace all lines onto the foil. Remove the layout and carbon paper, and go over the traced lines with an engraving bit. A dentist's bit or a Dermal carving bit is great for removing the copper foil. Be sure to wear eye protection. Shine a bright light through the board to check that all the copper has been removed from the lines. Check with an ohmmeter for "bridges" between sections. Use a #56 or 1/16-inch bit to drill holes for the components and the four mounting holes in the corners. To

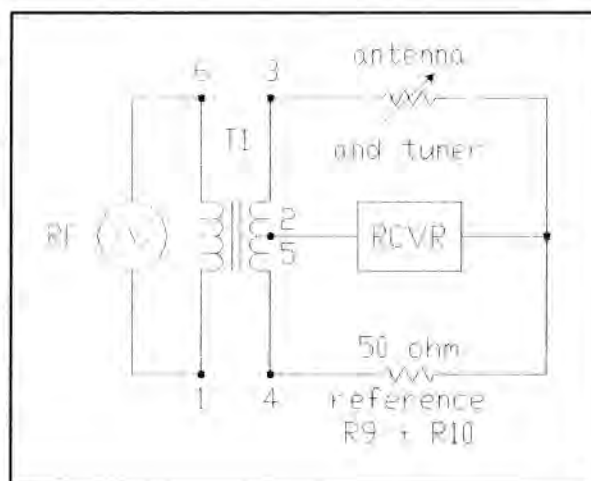


Fig 1—Wheatstone bridge block diagram.

facilitate soldering, it is a good idea to "tin" the board by applying a bit of solder around each hole before mounting any components.

## Toroidal Transformer

Cut a 915-mm (36-inch) length of #26 enamelled copper wire into three equal lengths 305-mm (12-inches) long. Twist three of the ends together and secure them in a vice. Wrap a piece of tape around the three loose ends and insert them into the chuck of an electric drill. Pull the wires tight to remove any slack, and then with a series of short, quick trigger pulls, try for six to eight twists per inch. Or you can make a loop in the loose end, put a screwdriver through the loop, and manually twist the wires. Wrap this "three-wire cable" around the Amidon toroid core eight times. Scrape the enamel off all wire ends, and with an ohmmeter, establish which wire is which. Label the ends of the wires 1 and 6, 2 and 5, 3 and 4. Arrange the wires so 1 and 6, 2 and 5, and 3 and 4 are opposite to each other. Coat the entire assembly with a liberal application of clear nail polish to keep everything in place.

## Assembly

Install and solder all components as shown in Fig 4, the parts placement diagram. Connect the switch wires and route the LED and its wiring to the front panel near

the switch. Install the coaxial cable connectors and the fuse holder on the rear panel. The nine-volt battery can be mounted inside the cabinet or on the rear panel.

### Some Final Notes

When the antenna tuner is adjusted to 50 ohms, the RF signal from the bridge will fade to zero and background signals *can* be detected. Without the Zener noise signal to remind you that the bridge is still in the line, you may accidentally transmit while the bridge is turned on. Unless you have a source of large quantities of fuses at a low price, **DON'T FORGET TO TURN OFF THE BRIDGE** when transmitting!

Many thanks to John Smith, VE6AI, and Bill Herman, VE6CSI, for their construction comments, and for encouraging me to write this up!

### Parts List

- B1—9-V battery
- C1, C3—C6—0.01- $\mu$ F 50-V capacitors
- C2—0.1- $\mu$ F 50-V capacitor
- D1—6.8-V, 1-W Zener diode
- D2, D3—1N914 silicon diodes
- D4—2-V, 20-mA light-emitting diode
- F1—0.05-A or smaller fuse and fuse holder
- J1, J2—chassis-type SO-239 coax connectors
- Q1, Q2—2N222 NPN transistors
- R1—1.8-k $\Omega$  1/2-W resistor
- R2, R3—6.8-k $\Omega$  1/2-W resistor
- R4—470- $\Omega$  1/2-W resistor
- R5—1.2-k $\Omega$  1/2-W resistor
- R6—680- $\Omega$  1/2-W resistor
- R7—22-k $\Omega$  1/2-W resistor
- R8—10-k $\Omega$  1/2-W resistor
- R9, R10—100- $\Omega$  1/2-W resistors
- S1a-c—3PDT switch (see Note below)
- T1—transformer on an Amidon FT-37-43 core
- U1—NE555 integrated circuit
- miscellaneous—8-pin DIP socket for U1, 915 mm (3 feet) #26 enamelled copper wire, battery holder and connector, switch knob

Note: For readers deeply concerned with impedance matching, switch S1a-c should probably be a ceramic wafer type. However, the author assures us that a miniature 3PDT general-purpose lever switch works just fine. A final note: VE6HA's full-size diagrams for this article are available. Send an SASE to George Murphy, VE3ERP, 1095 Mississauga St W, Orillia, ON L3V 6W7 —Editor

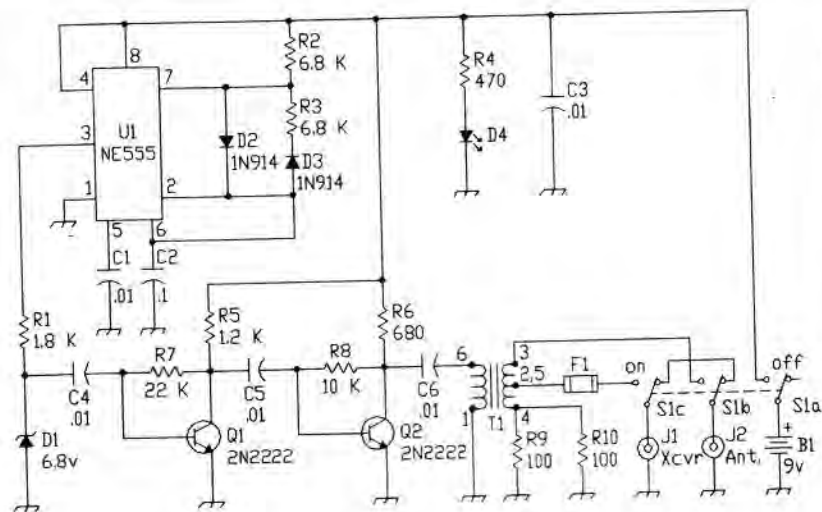


Fig 2 (above)—Circuit diagram.

Fig 3 (right)—Parts placement (plain side, reduced to 50%).

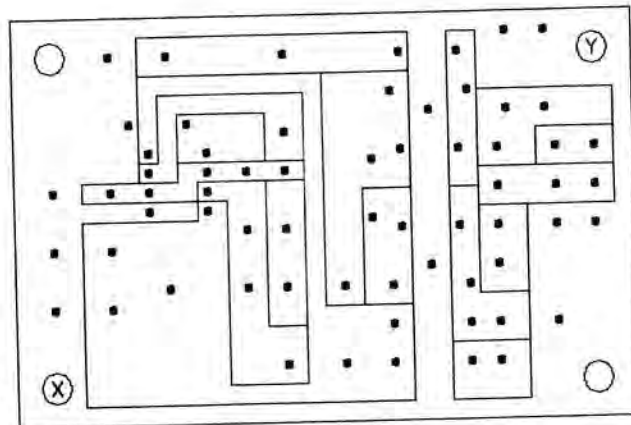
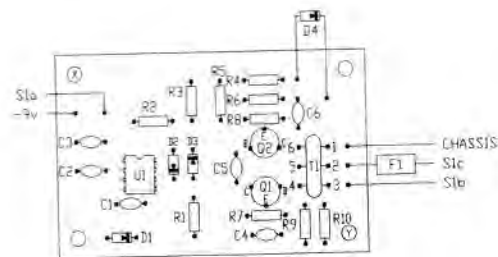


Fig 4 (right)—Parts placement (foil side, full-size for use with carbon paper).

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# IARU

## Everything you need to know before WARC '92...

By George Spencer, VE3OZW  
RR 1  
Jordan, ON L0R 1S0



From time to time we amateurs read or hear about the International Amateur Radio Union (IARU), and it seems to be some obscure and far-off thing having little to do with the subjects that interest us in our pursuit of happiness via Amateur Radio.

But IARU is important. It operates on a global basis and is instrumental in establishing internationally agreed-to rules, methods of operation, and band plans. Amateurs learn early in the game that there are QSL Bureaus and certificates for Worked All Continents (WAC). But most don't realize that these are actually examples of services and benefits arranged by IARU. Indeed, our assigned frequencies, without which Amateur Radio would not exist, are a direct and tangible result of the efforts of IARU on behalf of all amateurs.

The IARU has two main levels. There are (1) the world-wide organization consisting of the Administrative Council (its members are chosen at large), and the International Secretariat (the IARU member-society that agrees to do the bookwork; at the moment, this is ARRL), and (2) the three regional organizations:

*Region 1:* Europe, Africa, and nearby islands,

*Region 2:* North and South America, and nearby islands,

*Region 3:* the rest of the world

IARU is structured much like the International Telecommunications Union (ITU). To understand IARU and how it operates, it is helpful to know something about the ITU.

### The ITU: Mainly Historical

ITU began over a century ago as the International Telegraphic Union. This resulted from the invention of the telegraph in 1843 by Samuel Morse. The telegraph became a worldwide reality only a few years after its invention, and it created many problems, especially in Europe with its many languages in relatively small countries close together.

For many hundreds of years, the educated elite in those countries had communicated the written word in Latin and other common languages. The telegraph created a need for *instant* translation of words and ideas across borders—by liter-

ate but not necessarily well educated people. Countries needed to agree on Morse characters for letters, accents and other symbols. This led to the development of the Q-code, still used by commercial interests and by radio amateurs.

Of course when radio came along near the beginning of this century, it was in the form of wideband spark transmissions. There was no such thing as modulation by speech or music, and Morse code filled the requirements of the day, namely to get the written word out over long distances, in this case without wires! Naturally, the standard signals and procedures used in telegraphy also worked for radio, and the international organization, ITU—with the "T" still standing for "telegraphy"—filled radio's needs very well. ITU standards for radio were readily accepted by ITU member-nations and the Q-code was amended to fit some of the peculiarities of radio.

The development of CW gave each station its own frequency, and to prevent chaos, frequency allocation became a function of the ITU. Groups of frequencies, that is bands, were established for specific purposes: commercial radio, navigation aids, broadcasting, and Amateur Radio. Standards were developed relating to frequency stability, different methods of modulation and so on, right up to today's requirements for space communications. Along the way, the name was changed to International Telecommunications Union and after World War 2, it fell under the jurisdiction of the United Nations (UN)—just like many other international organizations: ICAO for air transportation and WHO for world health.

The Constitution of the UN permits only one vote to each member-nation and it is the same with ITU. It does not matter whether a country is large like the United States or the USSR, or small like Luxembourg or an island—possibly having no amateurs at all. If it is a sovereign nation and a member of ITU, it has one vote. There are now over 160 nations in the ITU, and some of them have very little interest in Amateur Radio.

### The IARU: Mainly Historical

So where does Amateur Radio fit in? You may have read or heard of Clinton DeSo-

to's book *200 Meters and Down* written in 1936. The title comes from the frequencies first assigned to amateurs after commercial and governmental interests began to make use of radio. Of course, amateurs pioneered the use of 200 metres and down, and demonstrated that much greater distances could be covered on these shorter wavelengths than on longer ones, even using relatively low power and small antennas. When commercial interests also moved onto the shorter wavelengths, it became obvious that unless something was organized to influence the governments that voted on ITU resolutions, amateurs eventually might be squeezed out altogether.

In 1924, Hiram Percy Maxim, 1AW (later W1AW), founder of ARRL, was on a business trip to Europe. During that trip he met with prominent European radio enthusiasts and discussed the formation of an international amateur radio union. Those enthusiasts were not all licensed amateurs: many European countries did not permit Amateur Radio in those days. However, the meetings did lead to the formation of IARU in Paris in 1925—more than 64 years ago, Canada was one of the twenty-five founding members represented at that historic gathering.

Initially, IARU had individual memberships, but in 1928 the constitution was amended to change to society-membership, one society representing each country. Today, it is quite clear that if that organization had not been formed, Amateur Radio would not exist today, at least not in its present form.

At the founding of IARU, Canadian amateurs were represented by the Canadian Division of ARRL. Because the Canadian Division has since evolved into CRRL, CRRL is the Canadian national society recognized by IARU. This recognition by the worldwide amateur community means that CRRL is a full voting member of IARU, participating in its activities, and sharing its services like the QSL bureau system.

### How IARU Operates

If amateurs cannot vote at ITU, and the ITU is the governing body on matters like frequency allocation, how can IARU be effective? The answer can be found in



# MFJ TUNERS

Here is the finest 3 KW Tuner money can buy with roller inductor, dummy load, new peak reading meter, antenna switch, balun plus more ... \$ 599

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With three continuously variable components - two massive 6 KV capacitors and a high inductance roller inductor - you get precise control over



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SWR and the widest matching range possible from 1.8-30 MHz.

You get a new lighted peak and average reading Cross-Needle SWR/Wattmeter with a new more accurate directional coupler.

You get a giant two core balun wound with teflon wire for balanced lines and a 6 position antenna switch with extra heavy switch contacts.

Its compact 10 3/4 x 4 1/2 x 1 1/2 inch cabinet fits right into your station.

You get a 50 ohm 300 watt dummy load for tuning your exciter, a tilt stand for easy viewing and a 3 digit turns counter plus a spinner knob for exact inductance control.

## 2-knob Differential-T™ Tuner



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The new MFJ-986 Differential-T™ 2 knob Tuner uses a differential capacitor to make tuning foolproof and easier than ever. It ends constant re-tuning with broadband coverage and gives you minimum SWR at only one best setting. Covers 1.8-30 MHz.

The roller inductor lets you tune your SWR down to absolute minimum. 3 digits turns counter lets you quickly return to your favorite frequency.

You get MFJ's new peak and average reading Cross-Needle SWR/Wattmeter with a new directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312.

A new current balun for balanced lines reduces feedline radiation and forces equal currents into antenna halves that are not perfectly balanced for a more concentrated, stronger signal.

## MFJ's Fastest Selling Tuner



MFJ-941D \$179

The MFJ-941D is MFJ's fastest selling 300 watt PEP antenna tuner. Why? Because it has more features than tuners costing much more and it matches everything continuously from 1.8-30 MHz.

It matches dipoles, vees, verticals, mobile whips, random wires, balanced and coax lines.

SWR/Wattmeter reads forward/reflected power in 30 and 300 watt ranges. Antenna switch selects 2 coax lines, direct or through tuner, random wire, balanced line or tuner bypass. Efficient airwound inductor gives lower losses and more watts out. Has 4:1 balun. 1000 V capacitors. 10x3x7 inches.

NOW IN STOCK: (Finally)  
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The MFJ-949D gives you lower SWR than any tuner that uses two tapped inductors. Why? Because you get two continuously variable capacitors that give you infinitely more positions than the limited number on switched coils.

This gives you the precise control you need to get your SWR down to a minimum. After all, isn't that why you need a tuner? Covers 1.8-30 MHz.

You get MFJ's new lighted 2 color peak and average reading Cross-Needle SWR/Wattmeter, dummy load, antenna switch, and 4:1 balun - all in a compact 10x3x7 inch cabinet. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312.

With MFJ's deluxe 300 watt PEP tuner you get an MFJ tuner that has earned a reputation for being able to match just about anything - one that is highly perfected and has years of proven reliability.

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MFJ-945C \$149

Don't leave home without this mobile tuner! Have an uninterrupted trip as the MFJ-945C extends your antenna bandwidth and eliminates the need to stop, go out and adjust your mobile whip.

You can operate anywhere in a band and get low SWR. You'll get maximum power out of your solid state or tube rig and it'll run cooler and last longer.

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For a few extra dollars, the MFJ-962C lets you use your barefoot rig now and have the capacity to add a 1.5 KW PEP linear amplifier later. Covers 1.8-30 MHz.

You get two husky continuously variable capacitors for maximum power and minimum SWR. And lots of inductance gives you a wide matching range.

You get MFJ's new peak and average reading Cross-Needle SWR/Wattmeter with a new directional coupler for more accurate readings over a wider frequency range. It reads forward/reflected power in 200/50 and 2000/500 watt ranges. Meter lamp uses 12 VDC or 110 VAC with MFJ-1312.

Has 6-position antenna switch and a teflon wound balun with ceramic feedthrough insulators for balanced lines. 10 3/4 x 4 1/2 x 1 7/8 inches.

## MFJ's smallest Versa Tuner

MFJ-901B \$109

The MFJ-901B is our smallest - 5x2x6 inches - (and most affordable) 200 watt PEP tuner - when both space and your budget is limited. Good for matching solid state rigs to linears.

It matches whips, dipoles, vees, random wires, verticals, beams, balanced and coax lines from 1.8-30 MHz. Efficient airwound inductor. 4:1 balun.

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the operation of consumer, environmental and citizen's groups of all kinds found in a democratic society. IARU is a lobby group like the Consumer's Association of Canada, The Canadian Federation of Small Business, or the Canadian Manufacturer's Association. These special-interest groups know their subject matter very well and give advice to government, acting, of course, in the interests of their members. Some groups are concerned with only domestic matters but many have international interests and try to gain the support of governments at international meetings. At ITU conferences, where IARU maintains a watching brief as an accredited observer, amateurs and others with a stake in telecommunications attend meetings, and advise their governments' delegates of their wishes.

Of course no one, and that means the IARU representatives, goes to any meetings without extensive prior research and study. As a result no one needs to make a sudden decision on some unexpected matter. ITU agendas are published many months and often years in advance. Positions on ITU agenda items that might affect Amateur Radio are ironed out well in advance, first by the IARU member-societies in individual countries, and then internationally, at meetings of the three IARU regions. This part of the process is essential. If amateurs in each country simply went off in their own direction, they could easily persuade individual governments to vote in opposition to each other at ITU meetings. Worldwide Amateur Radio would soon lose out.

Once IARU member-societies have agreed on a common position, it becomes the responsibility of each IARU member-society to obtain the support of its government for that position before actual ITU meetings begin. As in any democratic system, sometimes there is not unanimous agreement on some of the positions adopted by the majority of member-societies in IARU. However, societies which disagree with some or all aspects of a resolution are duty-bound to support the majority IARU position when requesting their government's support at ITU.

Probably the best example of this process in action was at WARC '79, the World Administrative Radio Conference in Geneva where the new amateur bands at 10, 18 and 24 MHz were approved. The well-planned and well-coordinated IARU efforts took many years of mainly voluntary labour (there was also a small amount of paid labour). It was very successful. However, the final cost was substantial: well in excess of 2.5 million dollars US. The really unfortunate part is that, at the time, less than one third of the world's amateurs were members of the IARU member-societies that helped to pay the bills for the advance planning and the lobbying at Geneva—in short, for

everything that was necessary to protect, preserve and enhance Amateur Radio for everyone.

### WARC '92

The Tenth General Assembly of IARU Region 2 was held in Orlando Florida in September of this year. The most important decision made at this conference was to set in place the basic structure to prepare for a World Administrative Radio Conference (WARC) in 1992. At that conference, it is likely that, once again, non-amateur interests will make a concerted effort to acquire some of our HF, UHF and microwave frequencies. Over the past sixty years, these reviews of frequencies took place every twenty years. The last WARC was in 1979, but now we have another only thirteen years later! It sounds ominous and we do have much work to do before the next Region 2 meeting. Normally these meetings are three years apart but our IARU representatives are now doing their homework and they will probably have to meet late in 1991. In the meantime, there will be general assemblies in IARU Regions 1 and 3, in 1990 and 1991 respectively, and meetings of the IARU Administrative Council.

### Who pays for IARU?

Each IARU member-society pays annual dues to its IARU regional organization. In Region 2 it is payable in US dollars. (In Region 1 it is in Swiss francs, in Region 3, in Japanese yen.) In Region 2, dues cover administrative expenses and travel expenses, so the Region 2 Executive Committee can meet once a year as required by the Region 2 Constitution. Additionally, there are expenses incurred to allow two Region 2 representatives to travel to meetings of the IARU Administrative Council, for area meetings to assist less organized societies, and for general expenses related to activities that help protect our amateur interests.

In addition to the Region 2 operating budget which is approved every third year at a Region 2 general assembly, a special initial WARC '92 budget of US \$150,000 was approved in Orlando. This money will be over and above the normal dues paid by Region 2 member-societies.

Each Region 2 member-society also pays for its own IARU administrative activity, including expenses to send its voting delegate to the Region 2 general assemblies. Depending on location of host country, airline fares and hotel rates, this costs CRRL about \$US 600 per year. Annual IARU membership dues are based on the number of licensed amateurs in each country. Present cost is \$US 0.07 per Canadian amateur. This means that dues paid by CRRL for Canadian support of IARU for about 23,500 amateurs, plus the expenses outlined above total about \$US 1645 + \$US 600 = \$US 2245 per year. At

the present exchange rate, CRRL's 5500 members are paying about \$CDN 0.48 per year to support the work of IARU.

The creation of a single Canadian Amateur Radio society would certainly help. But rebate of our annual license fees paid to DOC—so all Canadian amateurs and not just CRRL members would be supporting IARU—would help a lot more! DOC—are you listening?

*George Spencer, VE3OZW, is a former Canadian Division director of ARRL, and a founding director of CRRL. He was head of the Canadian delegation to the recent Tenth General Assembly of IARU Region 2 held in Orlando, Florida. He and CRRL President Tom Atkins, VE3CDM, have both served as treasurer of IARU Region 2. During the Orlando meeting, Tom was elected secretary of Region 2 and made a member of the nine-person IARU Administrative Council.*

*Since the formation of the Region 2 organization in Mexico City in 1964, Canadian amateurs have been involved as elected members of the Region 2 Executive Committee. Noel Eaton, VE3CJ was Region 2's first treasurer. He went on to become President of IARU, and led the amateur delegations that worked to get us the three new HF bands—10, 18 and 24 MHz—at WARC '79 in Geneva.*

*A word about proposals made at IARU general assemblies: Proposals must originate with a society that carries a vote. Only one society is recognized per country. Of interest to members of the Canadian Amateur Radio Federation (CARF), although CRRL and its predecessor, the Canadian Division of ARRL, have been the international representative of Canadian amateurs for some sixty-four years, CARF has not been forgotten. CRRL has invited CARF to supply material for consideration at the last three Region 2 general assemblies. CRRL has also supplied CARF with full reports following each general assembly. This year, for the first time, CARF prepared a submission which CRRL forwarded to the Region 2 General Assembly in Orlando. CARF suggested that bandwidths for digital operation be specified in terms of maximum permitted bandwidth rather than attempting to name each digital mode and assign bandwidth limits. However, a similar proposal had already been submitted by Radio Club Argentino (RCA) before the deadline for translation into Spanish and advance distribution. Because the RCA proposal was so similar to the CARF proposal, it was actively supported by CRRL representatives at the General Assembly, both during Committee B discussions and in the final Plenary Session where the proposal was adopted. ■*



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## New Radiocommunications Act

On Thursday, October 19, the new *Radiocommunications Act* received royal assent. The *Radiocommunications Act*, which replaces the old *Radio Act*, contains the enabling legislation that allows the Minister of Communications to make regulations. What will change for amateurs? Virtually nothing at this time. All present regulations remain in effect. One new twist: the *Radiocommunications Act* allows the Minister to make regulations governing the RF susceptibility of non-radio devices. That means that the Minister can now make regulations that could prevent the reoccurrence of something like the Jack Ravenscroft case. CRRL will be contacting DOC to ask that this become a priority.

### VE1UU NEW CRRL ATLANTIC DIRECTOR

Thanks for a job well done to Andy Mclellan, VE1ASJ, who has advised that for family and business reasons, he is retiring as CRRL Atlantic Director and Manager of the CRRL Central Incoming QSL Bureau. Best wishes to Maritimes-Newfoundland Section Manager Carl Anderson, VE1UU, who has agreed to fill out the remainder of Andy's term as director, and to Don Welling, VE1WF, who has agreed to become manager of the CRRL Central Incoming QSL Bureau.

### SYMPOSIUM REPORT

About 45 amateurs attended the DOC Symposium sponsored by CARF, the Canadian Amateur Radio Federation, and Scarborough Amateur Radio Club, held in Toronto on October 21. What was learned? Restructuring of the Amateur Service is on schedule. Amateurs who have passed the theory and regs for the present Amateur Certificate will receive credit in the form of a new Basic qualification when restructuring takes place. In the future, Amateur Radio examinations will be administered by DOC, clubs and specially appointed volunteers. A new RIC-1 will provide the guidelines. DOC values the work of ARES and other Amateur Radio emergency groups, and often mentions Amateur Radio's emergency communications capabilities in memos to other radio services. Unfortunately, it was not all good news. In southwestern Ontario, nearly all commercial frequencies below 890 MHz are loaded to full capacity. As a result, the 220-MHz amateur band may soon come under pressure similar to that in the US.

### HOPE YOU DIDN'T MISS IT DEPT

☐ To commemorate Remembrance Day and the 50th Anniversary of Canada's



Andy Cobham, VE2PPP (centre, turned to the audience), of DOC Ottawa makes a point during the VHF-UHF session at the recent Amateur Radio symposium sponsored by CARF and Scarborough ARC. On the podium: CRRL's Dana Shtun, VE3DSS, who chaired this particular session. (VE3GRO photo)

entry into World War 2, members of Guelph Amateur Radio Club operated special-event station VG3W from McCrae House, Guelph, Ontario, on November 10-12. Guelph is the birthplace of Colonel John McCrae who wrote the famous poem, "In Flanders Fields".

☐ To commemorate the 350th Anniversary of Ste-Marie-Among-the-Hurons, the first European settlement in Ontario which was located near present-day Midland, amateurs in Ontario were able to use the special prefix XL3 from October 24 until November 24.

### ARRL DXCC/AWARDS UPDATE

☐ Garth Hamilton, VE3HO, CRRL's representative on the ARRL DX Advisory Committee (DXAC) reports that some recent changes to the DXCC rules have created their own problems. These are now being sorted out. DXAC is now voting on possible DXCC status for the following: Austral Island (FO), Marquesas Islands (FO), Conway Reef (3D2), Frederick Reef (VK9), and Banaba/Ocean Island (T33). Other DXCC country applications currently under discussion include Basilica del Santo (HV), Brazilian State Acre (PV), Walvis Bay (ZS1) and Tatoosh and Guemes Islands (W7). Any Canadian amateur with comments on DXCC rules or the DXCC countries list should contact VE3HO at Box 1156, Fonthill, Ontario L0S 1E0.

☐ As a result of a decision at the IARU Region 2 General Assembly, held in

Orlando, Florida, in September, ARRL has changed its policy with respect to awards credits on the 10-MHz band. Effective immediately, ARRL accepts 10-MHz contacts for the following awards: WAS (basic, CW, RTTY, packet and QRP, but not for single- or 5-band WAS); and DXCC (CW and digital QSOs for the mixed, CW and RTTY awards, but not for 5-band DXCC). In other ARRL news, W1AW is expected to begin bulletin transmissions on 10.140 and 18.100 MHz soon.

### SATELLITE NOTES

☐ The second Japanese Amateur Radio satellite, JAS-1B, is scheduled to be launched in February, 1990. To publicize the launch, Japan Amateur Radio League has established special-event station 8J6JB. Look for 8J6JB on all HF bands, 1400-2000 UTC weekdays, 1400-2200 UTC Saturdays, and 1000-2200 UTC Sundays and holidays.

☐ UoSAT OSCAR 9 went SK on Friday, October 13, falling out of orbit after eight years and some 45,000 revolutions around the earth. UoSAT Oscar 9, whose "digitaltalker" played a key role in the Canada-USSR Polar Skitrek Expedition, was last heard by ZS6CCD at 1200 UTC.

### CRRL AMATEUR OF THE YEAR

Nominations are still open for this award. Send nominations and supporting documentation to CRRL, Box 7009, Station E, London, ON N5Y 4J9. ■



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The new Kenwood TS-790A VHF/UHF all-mode tri-band transceiver is designed for the VHF/UHF and satellite "power user." The new TS-790A is an all-mode 144/450/1200 MHz transceiver with many special enhancements such as Doppler shift compensation. Other features include dual receive, automatic mode selection, automatic repeater offset selection for FM repeater use, VFO or quick step channel tuning, direct keyboard frequency entry, 59 memory channels (10 channels for separate receive and transmit frequency storage), multiple scanning and multiple scan stop modes. The Automatic Lock Tuning (ALT) on 1200 MHz eliminates frequency drift. Power output is 45 watts on 144 MHz, 40 watts on 450 MHz, and 10 watts on 1200 MHz. (The 1200 MHz section is an optional module.)

- **High stability VFO.** The dual digital VFOs feature rock-stable TCXO (temperature compensated crystal oscillator) circuitry, with frequency stability of  $\pm 3$  ppm.
- **Operates on 13.8 VDC.** Perfect for mountain-top DXpeditions!
- **The mode switches confirm USB, LSB, CW, or FM selection with Morse Code.**
- **Dual Watch allows reception of two bands at the same time.**
- **Automatic mode and automatic repeater offset selection.**
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- **59 multi-function memory channels.** Store frequency, mode, tone information, offset, and quick step function. Ten memory channels for "odd split."
- **CTCSS encoder built-in.** Optional TSU-5 enables sub-tone decode.
- **Memory scroll function.** This feature allows you to check memory contents without changing the VFO frequency.

- **Multiple scanning functions.** Memory channel lock-out is also provided.
- **ALT—Automatic Lock Tuning—on 1200 MHz eliminates drift!**
- **500 Hz CW filter built-in.**
- **Packet radio terminal.**
- **Interference reduction controls:** 10 dB RF attenuator on 2m, noise blanker, IF shift, selectable AGC, all mode squelch.
- **Other useful controls:** RF power output control, speech processor, dual muting, frequency lock switch, RIT.
- **Voice synthesizer option.**
- **Computer control option.**

### Optional Accessories:

- **PS-31** Power supply • **SP-31** External speaker
- **UT-10** 1200 MHz module • **VS-2** Voice synthesizer unit
- **TSU-5** Programmable CTCSS decoder
- **IF-232C** Computer interface • **MC-60A/MC-80/MC-85** Desk mics • **HS-5/HS-6** Headphones
- **MC-43S** Hand mic • **PG-2S** Extra DC cable



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- **Extended receiver range:** 141-163.995 and 438-449.995 MHz; transmit on Amateur band only. (Modifiable for MARS and CAP. Permits required. Specifications guaranteed on Amateur bands only.)
- **Uses the same accessories as the TH-25AT (except soft cases).**
- **Volume and balance controls, plus separate squelch controls on top panel.**
- **Super easy-to-use!** For example, to recall memory channel, just push the channel number!
- **CTCSS encode/decode built-in!**
- **Automatic Band Change (ABC).** Automatically switches between main and sub band when signal is present.
- **Automatic offset selection on 2 meters.**
- **Tone alert system for quiet monitoring.** When CTCSS decode is on, the tone alert will function only when a signal with the proper tone is received.
- **Four ways to scan,** including **dual memory scan**, with time operated or carrier operated scan stop modes, and priority alert.
- **Automatic battery saver circuit extends battery life.**



• **Supplied accessories:** Dual band rubber-flex antenna, PB-6 battery pack, wall charger, belt hook, wrist strap, water resistant dust caps.

#### Optional Accessories

- **PB-5** 7.2 V, 200 mAh NiCd pack for 1.5 W output
- **PB-6** 7.2 V, 600 mAh NiCd pack
- **PB-7** 7.2 V, 1100 mAh NiCd pack
- **PB-8** 12 V, 600 mAh NiCd for 5 W output
- **PB-9** 7.2 V, 600 mAh NiCd with built-in charger
- **BC-10** Compact charger
- **BC-11** Rapid charger

- **BT-6** 6-cell AA battery case
- **DC-1/PG-2V** DC adapter
- **HMC-2** Headset with VOX and PTT
- **SC-22 and SC-23** Soft case
- **SMC-30/31** Speaker mics.
- **WR-1** Water resistant bag.

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Canadian Amateur Regulations Book	10.00	9.00	190	.75 <input type="checkbox"/>
Canadian Amateur Code Tapes (OT)	38.00	34.25	200	2.50 <input type="checkbox"/>
Canadian Advanced Question Bank	10.00	9.00	116	.75 <input type="checkbox"/>
Banque de questions premiere	10.00	9.00	113	.75 <input type="checkbox"/>
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Premier pas en radio, W1FB (RAQI)	8.00	7.25	490	.75 <input type="checkbox"/>
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## The CRRL Field Organization Forum

### SECTION MANAGER ELECTION RESULTS

Congratulations to Ernie Savage, VE7FB, who was recently re-elected CRRL British Columbia Section Manager. Ernie is a bit like Wayne Gretzky—he holds the record. He's the longest surviving Section Manager in either CRRL or ARRL. Ernie held the post shortly after World War 2, came back to it in 1962, and has been British Columbia Section Manager ever since.

### REPORTS FOR SEPTEMBER 1989

**Alberta:** SM/STM/DEC: Bill Gillespie, VE6ABC; ASM: VE6AMM; SEC/TC: VE6AFO; OO: VE6TY. The fall season has arrived and Amateur Radio classes are under way in various parts of Alberta. Band conditions are up and down but showed some improvement over August. Hopefully, the winter season will be better. I have just returned from two weeks in the Orient, so am not yet caught up on local happenings.

**British Columbia:** SM: Ernie Savage, VE7FB. British Columbia Public Service Net (BCPS, phone) meets daily at 0200 UTC on 3729 kHz. General net business is followed by a check-in session. Net Manager: Jim, VE7UN; Assistant Net Manager: Ford, VE7DDF. Net activity: Check-ins: low-137; high-170, and total-4100. British Columbia Emergency Net (BCEN, CW) meets daily at 0600 UTC on 3651 kHz. Code speed is 10 wpm, though traffic is handled at your speed. Often there is someone on the frequency at any time of day. BCEN is a member of NTS and checks into RN-7 nightly. Net Manager Ferdie, VE7EJU, reports things are slow. We are glad to see new members reporting their traffic activities. Please, also include your phone traffic in your reports. Thanks to our NCs: VE7s ANG, AVA, BCF, EJU, ESA, FME and FRZ. We need four more and a spare. Volunteers? Vancouver's new friendly repeater is VE7YVR, 145.49 MHz (-). Thanks, YVR Communications Group.

**Manitoba:** SM: Jack Adams, VE4JA; ASM: VE4IX; SEC: VE4TM; ATC: VE4ADP; NMs: VE4LB, VE4IX, VE4TE. Radio-wise, things have been quiet at your SM's QTH. Decided to move the shack to a bigger room. What a job! Would have been easier to take my treasures to the Brandon ARC Fleamarket. I missed it this year, but was told that most came by, though few brought anything to sell. Something like going to a cattle auction where no one brings the beef. Anyways, all our systems should be go by Thanksgiving. Recently purchased an IBM-compatible Lazer XT/3 with colour monitor and 24-pin printer. Packet station should be in full swing shortly. ARES is only as good as the people who make it. Your SEC, Rod Kischook, VE4TM, would like to hear from amateurs in various communities who would like to become ECs. Rod thanks all who helped out in the emergency evacuation of northern residents during the forest fire hazard this past summer. Hopefully, by the time this report is printed, we will have the Neepawa repeater. Are you a member of Winnipeg Repeater Society? If not, we need your help to link repeaters to talk from Vancouver to Toronto on 2 metres. With you as a member, it can become a reality.

**Maritimes-Newfoundland:** SM: Carl Anderson, VE1UU; ASM: Ned Mulrooney, VO1MN; STM: Mel Lever, VE1VX; BM: Brent Taylor, VE1APG; EC (NB) Brian Upton, VE1ZJ. From now on, new Amateur Radio station licences issued to Prince Edward Island amateurs will have call signs beginning with VY2. Holders of current station licences may adopt the VY2 prefix (retaining their present suffix) simply by applying to the DOC regional office in Moncton. No PEI amateur is required to change his or her call

**Reports invited:** CRRL Section Managers (SMs) and their Section-level assistants coordinate traffic handling, emergency communications and bulletin service across Canada. Your SM (name and address appears on page 2 of this *QST Canada*) welcomes reports of individual and club activities for publication in this column. Activities do not have to be related to the CRRL Field Organization or to CRRL.

sign, but can remain VE1. New Brunswick and Nova Scotia amateurs did not express a majority wish for a change, and remain VE1. The CRRL VE1 Incoming QSL Bureau will continue to serve all VE1/VY2 amateurs. PEI amateurs and island visitors: Don't miss Charlottetown ARC's breakfast meetings at Gentleman Jim's in the Charlottetown K-Mart Plaza, 0900 AST/ADT, Tuesdays, Thursdays and Saturdays. Congratulations to Silemon Park ARC (CFB Summerside, PEI) whose radio course produced at least nine new amateurs. Halifax ARC is running a course this fall and winter with about 35 in attendance. Other radio clubs, please let your SM know about your Amateur Radio courses and what success you are having. Shelburne ARC officers are Norm Hamilton, VE1BBC, president; Keith Williams, vice president; and Harold Blaknet, VE1BLK, secretary-treasurer. Thanks for the info, Harold. For much of the above, I am indebted to Tom, VE1CES, for copies of newsletter he receives from various clubs. I would like your club's current roster of officers for this column—and items about noteworthy activities you or your club are engaged in. Packet me VE1UU @ VE1EI. Thanks in advance! Finally, the holiday season is coming! Best wishes to all radio amateurs in the Maritimes-Newfoundland Section for a Merry Christmas. May 1990 be your best year ever.

**Ontario:** SM: Larry Thivierge, VE3GT; BM: VE3GSA; SEC: VE3GV; STM: VE3CYR; TC: VE3EGO. The rescue of an injured American woman from the central part of Isle Royale in Lake Superior might not have been possible if it had not been for the efforts of members of Thunder Bay's Lakehead ARC, especially VE3HQL and VE3EBL. The woman broke her arm while hiking and was discovered by an amateur who was also hiking. The amateur, Robert Pirkel, walked 6.5 km up a mountain trail and used his handheld transceiver to call Thunder Bay for help. Radio contact between Isle Royale and Thunder Bay lasted about two hours while preparations for rescue were being made. The woman was picked up and taken to a Michigan hospital by a Thunder Bay air ambulance helicopter. Algoma ARC (Sault Ste-Marie) sponsors the Friendly Borders Award. Details are available from Awards Manager, VE3SDX. Algoma ARC also operates two repeaters in the Sault Ste-Marie area: VE3SSM and VE3SJI. It looks like an active winter on ATV in the London area with some 20 amateurs with down-converters and antennas for their new split-band ATV repeater. VE3SB has been bitten by the packet bug and is having a lot of fun. VE3TRW presented VE3ACY with the first QSL (#1) issued by Environment Canada for the Weatheradio Canada station, VE3AVS, VE3HTM and VE3LMV are returning as teachers for Lakehead ARC amateur classes. VE3NGR and VE3NGO are both sporting new TS-440s. Watch out for Kenwood's new TS-950SD. VE3SJO is now K8MQN. VE3EZJ is now VE3EFM. New appointments in the Section are OBS: VE3JPP, VE3KLX and VE3WHT; and EC (Prince Edward County): VE3KKX. The Waterloo-region magazine *New Era* contained an interesting article on VE3BCZ who, in addition to being an active amateur, is a folksinger, puppeteer, librarian, professor and administrator. The menu of his life is lengthy! New members of Niagara Peninsula ARC are VE3TEC, VE3WGE and VE3WWG. New amateurs are VE3CIM, VE3WPD and VE3YFF. VE3IJZ, VE3NPS and VE3XRC have their Advanced. On behalf of everyone in the Ontario Section field organization, may I wish all of you a very Merry Christmas and every good wish for the New Year, 1990.

**Quebec:** SM: Harold Moreau, VE2BP; STM: VE2EDO; SEC: VE2LYC; BM: VE2ALE. The Drummondville Hamfest on September 30 drew almost as big a crowd as the Sorel Hamfest did in May. Félicitations à tous les membres du club de Radio Amateur de Drummondville, qui ont réussi avec succès le hamfest, le 30 Septembre. Le club de Ste-Hyacinthe à une vingtaine de candidats qui participent aux cours de Radio Amateur.

**Saskatchewan:** Bruce Rattray, VE5RC. It's October 6 and we are slowly but surely slipping into the bonds of winter. Now is the time for all good amateurs to come to the aid of antenna parties. Congratulations to the new Saskatchewan CRRL volunteer team of Gord, VE5GF, Section Bulletin Manager; Bob, VE5FY, Section Emergency Coordinator; and Erwin, VE5ELJ, Section Traffic Manager. I had a pleasant surprise the other day when VY1FF broke in on 20 metres. Turned out it was Gerrard, ex-VE5FF, formerly of Prince Albert and now in Whitehorse with his XYL, Doreen, and two harmonics. The entire family will be visiting Regina in December. Packet Radio is alive and well in Saskatchewan. There is a new packet digipeater in Aylsbury: VE5AY-3 K-node can be reached via VE5GF or VE5ARG. I understand some problems on the Aylsbury-Hanley path need to be worked out. All local radio clubs are back in full swing. If you don't belong to one, join. It's only through a united front that our hobby will survive the commercial pressures it faces every day, month and year. Hope everyone had a great Thanksgiving and that you were able to be with your family. I know the turkey here will never fly again! 73 and Merry Christmas and Happy New Year from Bruce and Bonnie.



## Silent Keys

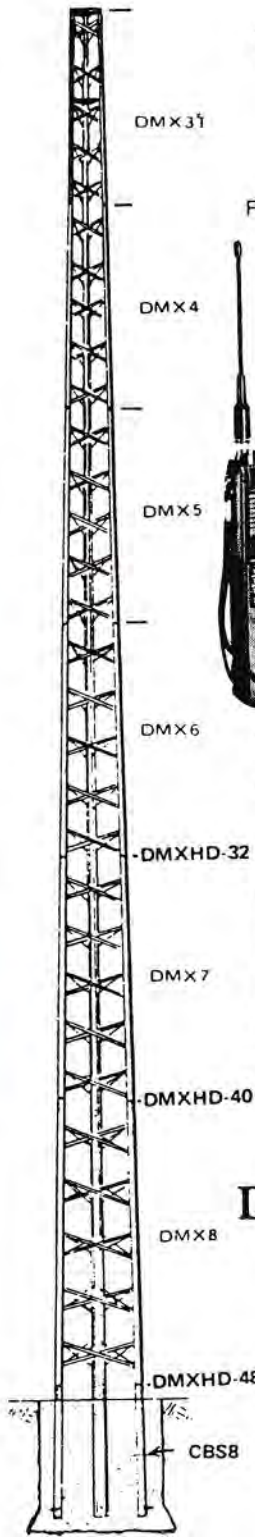
Conducted By Ray Staines, VE3ZJ

It is with deep regret that we record the passing of these amateurs:

VE3AGS, Wesley E Lawford, Toronto, ON  
VE3ATJ, Don Reavely, Ottawa, ON  
VE3BXL, Tom McClellan, London, ON  
VE3PZ, Howard Matthews, Guelph, ON  
VE6BL, Bill Wood, Grand Prairie, AB  
VE7AHK, Harold Irish, North Vancouver, BC

**Note:** Silent Key reports sent to *QST Canada* must include name, address and call sign of reporter in order to be listed. To avoid unfortunate errors, reports are confirmed only through acknowledgement from the family of the deceased. Thus, those who report a Silent Key may not receive an acknowledgement from *QST Canada*.





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## Didn't You Get It?

Didn't you get it? Everyone in class *has* paid attention, and *understands* all that great new technical information that you covered during the evening. I mean, haven't you been very clear in your explanations and handled all the questions that your inquisitive students have dropped on you? I mean, you have covered the same material for dozens of years and it is crystal clear in your mind, so there should be no problem. Well, all of us who attempt instruction in a technical field do tend to get caught up in our theory and sometimes we make some very bad assumptions about the absorption rates of the students facing us in Ham Class 101. Keep in mind that the great majority of those aspiring amateurs do not have a technical background. They do not intend to service their amateur equipment or trace faults in their PCs.

Those of us instructing Amateur Radio classes must "get them up to speed" and make sure that an appreciation for and an understanding of electronics does occur. One thing to keep in mind while preparing for and instructing your group is that each student will learn a lesson more quickly and retain the knowledge if the material is presented in the right style for that person. Holy smokes! That means ten styles for ten students! In theory that is correct, but we have to strike a happy medium or else we would never finish the simplest lesson. All students should have some kind of text. Thus, those who learn through reading are already covered. You are going to be doing a lot of "lecturing" and maybe even some board (never bored) work, so those who like to listen and watch will be picking up their information then. I bet we have covered a lot of the class by now. However, let's verify the theory and provide some proof that all the abstract and invisible things that we accept in electricity really do work.

### Demonstrations

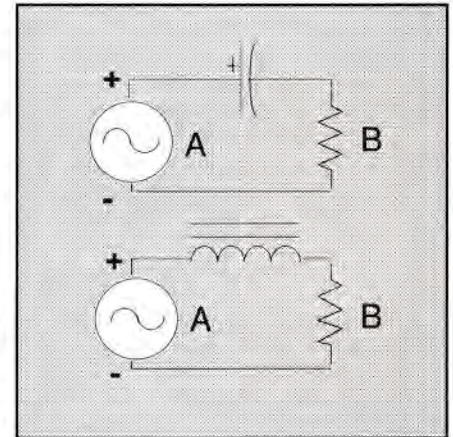
Some students must "see it work" and will then ask questions in order to understand and remember new concepts. The demonstration of a working model, whether a machine or an electric circuit, will add that little extra to a lesson and helps everyone. In an earlier column, I listed the basic equipment you would need for demonstrations. This list included a 'scope, and audio generator, and some capacitors, inductors and resistors. In some cases a TVM, or DVM could be used for ac measurements as long as waveform analysis wasn't required. These instruments could be substituted for the 'scope. Let's assume you have discussed

capacitors and dc and have demonstrated charge and storage by suitable flashes and bangs! By now that student is aware that the capacitor and inductor have an ability to store different forms of energy when dc is applied. After reading about capacitors and inductors in ac circuits, and giving your "best ever" lecture on reactance, everyone is ready for a demonstration.

### Reactance and stuff

To demonstrate capacitive reactance, use a simple RC series circuit with a 1-k $\Omega$  resistor, and an 0.01- $\mu$ F capacitor, and an audio generator as the source of emf. (See the diagram.) The best setup would use a dual-beam 'scope, with one channel (A) looking across the generator and the other channel (B) looking across the resistor. The generator is set at a frequency of about 16 kHz and adjusted for about 10 volts peak-to-peak as shown on channel A. Now channel B should indicate about 5 volts peak-to-peak. (Remember, C and R are acting as a voltage divider). Now, change the generator frequency to 100 Hz and make sure channel A is still at 10 volts peak-to-peak. Observe channel B. The very low value is because of the reactance of the capacitor. Now increase the frequency of the generator slowly and let the students observe the output (voltage across the resistor). Have the students record the output at various frequencies. Remind them of Kirchhoff's voltage law and have them estimate the "reactance" of the capacitor, based on the ratio of applied voltages: the voltage across the resistor and the calculated voltage drop across the capacitor. What they're seeing is the reactance changing as the frequency of the applied signal changes. Again, change the frequency and observe the output and the apparent opposition to the flow of ac current at different frequencies.

To demonstrate inductive reactance, use a simple LC series circuit with a 1- to 5-henry inductor and a 1-k $\Omega$  resistor, and the same audio generator as source. (Again, see the diagram.) The inductor should be chosen for lowest resistance (that's a dc measurement!) if you have a choice of several fleamarket specials. That's where I get most of my demo samples. Channel A looks across the generator (10 volts peak-to-peak) and channel B across the 1-k $\Omega$  resistor. I would start at 30 Hz. Now increase the frequency of the generator, maintaining a constant input, and watch the output voltage fall. The voltage drop can be attributed to the action of the voltage divider again, but this time the reactance is increasing with frequency and so a greater voltage drop



occurs across the inductor, and less appears at the output, channel B.

We will use the same components to demonstrate resonance and "Q" in our next column. 73. ■

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## 1990

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This is the most comprehensive edition since the **Handbook** was first published in 1926. The sixty-seventh edition contains over 1200 pages and over 2100 tables, figures and charts. Added to this edition are new antenna projects including three high-performance Yagis for 144, 220 and 432 MHz designed by Steve Powlishev, K1FO. Dick Jansson, WD4FAB, has completely revised the space communications chapter, which includes his innovative helical array for AO-13 Mode L.

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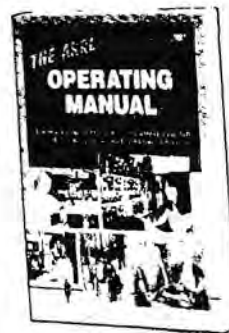
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ing made, from time to time, to increase this value.

The receiver at 9BP is a Paragon RA-10 regenerative tuner with a Paragon DA two-stage audio amplifier.

There is nothing unusual about the antenna. It is of the conventional inverted-L type consisting of a cage 75 feet long and 63 feet high for the top part, with a lead-in 45 feet long. A counterpoise of 12 wires 85 feet long and fanned somewhat is located directly beneath the antenna.

For some years Jack Barnsley has been more or less connected with radio. He was first bitten by the bug in 1910 and now laughingly relates how his first set consisted of a bit of haywire, a homemade coil and detector, and a telephone receiver borrowed from one of Mr. Bell's telephones. It was in 1914 that he started out as a commercial operator and worked on all of the coasting steamers operated by the Union Steamship Co. of B. C. Ltd. He then made several trips across the Pacific, joined the Royal Air Force during the war, and finally returned to Prince Rupert where he is now agent for the Union Steamship Co.

In recognition of his splendid accomplishment of being the only amateur station to successfully communicate with WNP after a long period of silence, he was presented by the Chicago Radio Laboratory with a complete Zenith receiving set, which he prizes highly.

#### 2BN, MONTREAL, QUE.

Canadian 2BN is another station whose signals are consistently heard over the greater part of the United States and Canada. The operator is Mr. J. L. Miller,



2BN Has Three More Walls Like This.

who has had considerable experience as a commercial operator and handles traffic in good style.

There are two transmitters and two receivers at this station. In the upper left-

hand corner of the photo is the transmitter that utilizes one 40-watt (input) French tube, arranged in bread-board fashion. 1500 volts of chemically rectified current is supplied the plate circuit of this transmitter. The note is smoothed somewhat by a .5-microfarad condenser across the line although it is not pure D.C. Although this set has only been in a short time it has been heard at points 1500 miles distant.



Canadian 2BN

tant on several occasions.

The other transmitter, shown on the left of the table in the picture, is a Westinghouse TF set using four 5-watt tubes for C.W.; or two as oscillators and two as modulators for phone. The antenna current is 3.4 amperes on C.W. This transmitter is the one mostly used and has been heard in all districts of the United States and Canada. Plate current is furnished through a Kenotron rectifier system which may be seen just to the right of the TF transmitter in the picture.

On the table to the right of the picture is a Reinhartz receiver and next to it a single-circuit receiver with a stage of audio amplification. A Magnavox power amplifier and loud speaker may be seen above this.

There is nothing unusual about the antenna system at 2BN for it is of the conventional flat-top inverted-L type, 65 feet high and 75 feet long with a counterpoise suspended beneath it.

#### 3XN-9CF, LONDON, ONT.

The first C.W. set at 3XN-9CF used two 5-watt tubes with 10 volts on the filament, 1000 volts on the plate and 4.9 amperes in the antenna. This transmitter lasted one month! The present set uses two 50-watt tubes in a Hartley circuit, with 2000 volts of chemically rectified 25-cycle juice on the plates. The antenna

current is 4 amperes with 200 mills on the plates. The best transmissions have been made to France, Porto Rico, Hawaii, and the S. S. China when 1100 miles west of San Francisco.

The receiver is a Reinhartz set with three stages of audio amplification. One stage,



of course, is sufficient for most work.

Turning to the radiation system, the antenna is an inverted L, 60 feet long and 55 and 40 feet high at the ends. It consists of two 4-inch cages with six wires in

of Maine, near Halifax. Mr. Joseph Fasset, who runs the station, has long been in the radio game and still refers occasionally, with a smile, to the magnetic detectors and other crude apparatus used in the early days.

It was a great surprise to learn that his transmitter employs only four 5-watt tubes. The familiar Hartley circuit is used and most of the parts are homemade, including the transformers, grid leaks, tuning inductances, blocking condensers, and filter chokes. An electrolytic rectifier of 20 one-quart jars supplies current to a filter consisting of a .50-henry choke with a 4-microfarad condenser across the rectifier side of the supply and a 2-microfarad condenser across the supply next to the plates.

The receiver is a three tube regenerative set using "peanut tubes" run from dry batteries and performs very satisfactorily.

The antenna system consists of a flat-top 55 feet high at the far end and 25 feet high at the lead-in end. This flat top is 100 feet long and 12 feet wide. The



Canadian 1AR

each cage. A network of wires, fifty by twenty feet, and fifteen feet high forms the counterpoise.

Mr. C. H. Langford, the owner of the station, is prominent in Canadian amateur radio. He is City Manager for the A.R. R.L., Government Radio Inspector, and also sells radio apparatus. He is always willing to check any station's wave length as the Government has furnished him with a good wavemeter for this work.

#### 1AR, DARTMOUTH, N. S.

Clear across the continent from 9BP is station 1AR; another of Canada's better amateur stations. 1AR is situated at Dartmouth, 100 miles east of the eastern tip

counterpoise is 100 feet long, 15 feet high and is also 12 feet wide, located directly under the antenna. Both the antenna and counterpoise are carried directly to the walls of the house where the set is located and thus there is practically no lead-in. Because of the high antenna capacity the normal current in it is around six amperes.

Mr. Fasset now has a 500-watt tube and in a very short time expects to have it on the air and receive signal reports cards from the greater part of the world.

He tells us that his station is not much for looks, but we know from the way he comes in that it is built with the idea of getting results; and it sure does!

(Concluded on page 62)



## KENWOOD



TS-940, TS-680S, TS-440, TS-140



TM-721A, TM-231A  
TR-751A

TH-205AT, TH-215A  
TH-415A, TH-75A



TH-25AT, TH-45AT

## LEASE TO OWN

1. TRYLON 48' TOWER, 12-FOOT MAST AND MAST BEARING, HYGAIN HAM IV ROTOR PLUS 100' 8-WIRE CABLE, HYGAIN TH3JR 10, 15, 20-METRE ANTENNA, BN-86 BALUN, FOUR PL259 CONNECTORS AND 100' RG 213u ANTENNA WIRE...

(A) WITH KENWOOD TS-140S TRANSCEIVER AND PS-430 POWER SUPPLY

TOTAL PRICE—\$3900, CASH PRICE—\$3650

36-MONTH LEASE—\$142.58 PER MONTH

42-MONTH LEASE—\$127.76 PER MONTH

(B) WITH ICOM IC-735 AND PS-35 POWER SUPPLY

TOTAL PRICE—\$4200, CASH PRICE—\$3950

36-MONTH LEASE—\$153.55 PER MONTH

42-MONTH LEASE—\$137.54 PER MONTH

2. TRYLON 48' TOWER, 12' MAST AND MAST BEARING, HYGAIN HAM IV ROTOR PLUS 100' 8-WIRE CABLE, HYGAIN EXPLORER-14 10, 15, 20-METRE ANTENNA, BN-86 BALUN, SIX PL259 CONNECTORS, 200' RG 213u ANTENNA WIRE...

(A) WITH ICOM IC-761 TRANSCEIVER AND ICOM IC-275H ALL-MODE

TOTAL PRICE—\$8778, CASH PRICE—\$8550

36-MONTH LEASE—\$311.71 PER MONTH

42-MONTH LEASE—\$278.00 PER MONTH

(B) WITH ICOM IC-751A, PS-30 POWER SUPPLY AND ICOM IC-275H

TOTAL PRICE—\$7784, CASH PRICE—\$7500

36-MONTH LEASE—\$277.27 PER MONTH

42-MONTH LEASE—\$243.56 PER MONTH

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VHF & UHF Amps

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### PACKET Kantronics



PK-232, PK-87



1278

**MFJ**

1270B, 1274, 1278



## Working with Volunteers

At the suggestion of Ken Oelke, VE6AFO, EC for Calgary District and CRRL's Midwest Director, we'll be covering some of the contents of the *Emergency Coordinator's Manual* in this and subsequent columns. The *Manual* was published some years ago by the ARRL for the guidance of ARES ECs and AECs. This month we'll look at the subject of working with volunteers, with quotations from the *Manual*.

"Volunteers are the lifeblood of ARES. They are difficult to find, more difficult to keep, and at times, difficult to work with. Volunteers come in a wide variety of shapes, colours, sizes, backgrounds, skills, experience and levels of motivation. They have their own reasons for participating and their own specific needs which must be met if they are to continue to volunteer. Their needs, abilities and accomplishments determine the ultimate success or failure of ARES. The task of the EC is to discover and meet their needs while guiding them in the best use of their abilities, thus helping them to achieve significant accomplishments in public service.

"Volunteers are individuals who are willing to work with others to perform a necessary public service. They are human beings with human needs, goals, attitudes, strengths and weaknesses. Since volunteers will be the basic resource of the ARES group, it will be to the advantage of the EC to get to know each of them as well as possible.

"Generally, volunteers will do precisely what the EC wants them to do—no more, no less. It is up to the EC to convince them that the assignment selected for them is both needed and appropriate. Having their own likes and dislikes, it may be necessary to talk the volunteers into some assignments which are important though unpopular. Volunteers must be convinced that what they are being asked to do is really needed. Volunteers don't like to be underutilized, and tend to disappear when kept cooling their heels for a significant length of time. They will work for long hours under the worst conditions as long as they can see a need for it. Most will do anything you ask, as long as they're treated properly. If they are mistreated or abused, they may not volunteer their help again."

Why do they volunteer? The majority join out of a desire to serve the public in the way they best know how: as communicators.

"Volunteers have a right to expect courteous, considerate, fair and impartial treatment from the EC. Courtesy is

always in order; rudeness will cost dearly. In addition to learning and compensating for their weaknesses, and being tolerant of their faults, the EC must also consider their feelings. Never forget that ARES is taking precious time from their families.

"Unfortunately, some members will expect much more of the EC than they have a right to expect, and often more than can be given. They may expect the

EC to change situations over which the EC has no control, force other volunteers to change their habits, provide them with privileged treatment or status, fire a useful assistant because they happen to dislike the person, and other equally inappropriate actions.

"Each member has different job demands and family requirements, as well as other outside interests. This affects

## Field Organization Reports September 1989

### CRRL Section Emergency Coordinator Reports

Reports were received from the following SECs (DECs and ECs reporting to SECs are listed in brackets) denoting a total ARES membership of 812.

Reporting	ARES Members
VE3GV (VE3s EFX, FOB, FUN, GMU, GNW, HSF, JJA, KXB, LKI, LPM, LYW, KBU, MB, OZT, TNL)	570
VE4TM	-
VE6AFO (VE6s AMM, XD)	242

### CRRL Section Traffic Manager Reports

Call	Orig	Rcvd	Sent	Dlvd	Total
VE1ALU	1	12	13	0	26
VE1ADJ	1	8	0	9	18
VE1DLC	1	8	7	10	17
VE1IH	3	7	0	7	17
VE2BP	3	17	16	12	48
VE2WH	2	14	12	14	42
VE2JN	0	7	6	6	19
VE2ALE	0	2	2	0	4
VE3GT	2	55	93	0	150
VE3ORN	7	45	79	8	139
VE3ISD	2	56	62	10	130
VE3CYR	0	70	41	2	113
VE3GSQ	0	50	30	1	81
VE3BCZ	3	31	34	2	70
VE3GNW	0	20	34	0	70
VE3IN	1	35	3	7	46
VE3EAM	3	12	3	12	30
VE3SB	0	13	17	0	30
VE3KCZ	1	12	11	2	26
VE3EUI	0	13	8	4	25
VE3NVJ	4	7	9	3	23
VE3BDM	0	3	17	0	20
VE3DVE	0	6	11	2	19
VE3AJN	0	6	4	0	10
VE3BAJ	0	1	4	0	5
VE4JA	16	59	26	18	119
VE4JR	0	15	15	6	36
VE4LB	0	20	10	3	33
VE4STU	3	16	10	3	32
VE4TE	0	20	7	0	27
VE6CPP	-	-	-	-	25
VE6GUS	-	-	-	-	9
VE6ABC	-	-	-	-	8
VE6AKY	-	-	-	-	3
VE6QT	-	-	-	-	1
VE7EJU	3	88	51	2	144
VE7ANG	3	27	45	2	77
VE7OM	3	18	6	16	43
VE7BCL	4	14	66	10	34
VE7XA	0	6	24	4	34
VE7FRZ	2	9	22	0	33
VE7FME	2	7	11	1	21
VE7BCF	4	2	4	2	12
VE7FB	1	5	5	1	12
VE7BZI	1	4	1	4	10
VE7EGM	1	1	4	0	6
VE7CCJ	1	1	1	0	3

### National Traffic System

Net (Mgr)	Sess	QNI	QTC
APN (VE1BKM)	22	72	62
KTN (VE3AJN)	13	95	109
OLN (VE3POJ)	25	421	25
OPN (VE3IN)	30	518	165
OQN-1 (VE3GSQ)	12	19	17
OQN-D (VE3ORN)	22	66	19
OQN-E (VE3CYR)	29	118	94
OQN-L (VE3GSQ)	22	62	19
MTN (VE4IX)	15	120	15
MEPN (VE4LB)	28	849	19
MWX (VE4TE)	30	311	29
APSN (VE6AKY)	30	701	4
ATN (VE6CPP)	30	257	71
BCEN (VE7EJU)	30	628	128

### Brass Pounders' League

This listing is available to amateurs who report to their SM a traffic total of 500 or a sum of originations and delivery points of 100 or more for any calendar month. All messages must be handled on amateur frequencies, using standard ARRL-CRRL form, within 48 hours of receipt.

BPL: None this month

### Public Service Honour Roll

This listing is available to amateurs whose public service performance during the month indicated qualifies for 60 or more points in the following nine categories (as reported to their SM). Please note maximum points for each category: (1) Checking into CW nets, 1 point each, max 30; (2) Checking into phone/RTTY nets, 1 point each, max 30; (3) NCS CW nets, 3 points each, max 12; (4) NCS phone/RTTY nets, 3 points each, max 12; (5) Performing assigned NTS liaison, 3 points each, max 12; (6) Delivering a formal message to a third party, 1 point each, no max; (7) Handling an emergency message, 5 points each, no max; (8) Serving as an EC or NM for an entire month, 5 points max; (9) Participating in a public-service event, 5 points each, no max. Amateurs who qualify for Public Service Honour Roll 12 consecutive months, or 18 months out of a 24-month period, will be awarded a special certificate from CRRL Headquarters.

PSHR: VE4JA (124), VE3ORN (117), VE4LB (111), VE3GT (80), VE4STU (80), VE3BDM (75), VE4IX (72), VE7EJU (68), VE3CYR (66), VE4JR (65), VE4TE (56)

### Service and Specialized Nets

Independent Net Managers: Your monthly reports are welcomed. Send to CRRL, Box 7009, Station E, London, ON N5Y 4J9.

Net (Mgr)	Sess	QNI	QTC
ARES CANADA (VE3GV)	4	88	0
ARES ONTARIO (VE3GV)	1	4	0
CRRL ONTARS (VE3FQV)	30	9868	0
TRANS-PROVINCIAL (VE3EUI)	30	5864	0
ARG (VE5EE)	26	543	0
MJARC (VE5MML)	28	312	0
SWX (VE5EX)	30	718	0
SPN (VE5AE)	28	1095	11



training and preparedness and is particularly applicable to their availability in disasters, as some may be affected by the disaster. Some volunteers may join ARES and never be heard from again. Others will join and not find time for training, but will come out for disaster operations. The rest will be willing to take different amounts of training, and their availability for disaster service will change as their situations and interests change. Very few will be willing to take sufficient training to be able to lead, and even fewer will be willing to do the extra work. It should be remembered that volunteers are individuals and should be treated as such."

Various approaches are suggested in the *Manual*.

"First, most volunteers don't respond well to orders. They will honour requests, particularly if information is included on the need for the request.

"Second, if their loyalty is desired, the EC must be prepared to reciprocate. The responsibility for the ARES groups' success or failure lies with the EC whose loyalty must remain steadfast.

"Third, a member should never be criticized in public. People will respond better to criticism in private. A member should never be criticized personally—the criticism should be directed to the person's actions.

"Fourth, it should be recognized that factions and cliques will develop within ARES as they do with any other group. The impartiality of the EC will be questioned when it seems to members that 'Bill always seems to get the best job.'

"Fifth, when a member of the group complains about another member's lack of knowledge or operating skills, it should be kept in mind that some people simply learn faster than others. In an emergency, the member who is learning will still be needed.

"Sixth, a member's weakness, faults or limitations should never be discussed on the air or in public. If someone complains about another member in public, the situation should be handled as diplomatically as possible. The responsibility of the EC in such a situation is to solve the problem—not to take sides.

"Lastly, when a member is causing more harm than good in the ARES unit, it is important that the EC be diplomatic in any actions while keeping the effectiveness of the unit as the primary consideration.

"Working with volunteers is the most critical aspect of the EC's job and will call for the most time and effort. When leading volunteers, the EC should not try to be 'all things to all people'. The EC must be a diplomat, a leader, a friend, and expert in emergency communications and an excellent listener. It probably won't be possible to please all of the members all of the time. The approach should be to

lead the group, not simply to *manage* it.

## NANAIMO GROUP FORMED

We welcome the Nanaimo Amateur Emergency Communications Group, recently organized by Wilf, VE7US; Al, VE7BEQ; and Tony, VE7FGT. With the organization of this group, emergency coverage is extended to an important area of BC. We wish the group every success.

## EMERGENCY COMMUNICATIONS IN NEW ZEALAND

The New Zealand Amateur Radio Emergency Communications Group (AREC) was formed in 1932, following a disastrous earthquake. There are 74 Sections throughout New Zealand, each with its own Section leader. These groups liaise with emergency services including police, St John's Ambulance, Red Cross, Civil Defence, and Search and Rescue units. The organization, training programs and operating procedures are very similar to those we use in ARES. Over many years, AREC has made a strong contribution in severe storms, power failures, earthquakes, and searches for lost mountain climbers. —*Bob Boyd, VE3SV*

*ARES is a branch of the CRRL Field Organization, although you do not have to be a CRRL member to take part. It is hoped that this column, which also appears in The Canadian Amateur, will serve as an ongoing source of news and information about ARES activities across Canada. ARES members, particularly ECs, are invited to send information on what they are doing and developments they would like to share. Bob Boyd, VE3SV, will pull this together for future columns with the objective of increasing our ability to serve, should disaster strike.*

## It Seems...—continued from page 1

We think it's nostalgia that's been setting in—a desire to get back to basics, to a time when Amateur Radio was simpler and perhaps even a bit more fun. When everyone built their own transmitters, and perhaps their receivers too. When working someone outside of North America was something to be marvelled at and not just routine. When it was actually possible to understand everything that happened inside the equipment we used—and we could even repair it.

This month, for something different and perhaps as a bit of a Christmas treat, we've reproduced some pages from 1923 December *QST*. We think they catch the fun and excitement of Canadian Amateur Radio in the early days. We hope some of that excitement rubs off on you, so when

you turn on your rig at Christmas, you can pass that excitement along.

But now, back to the question. How many controls are there on the front panel of a TS-940S? The answer is 73. And that's our wish to you too, from all of us at CRRL and *QST Canada*. Have a happy holiday season, and may 1990 be your best year ever. —*Harry MacLean, VE3GRO, Editor*

## Canadian Stations—continued from page 17

QST

December, 1923

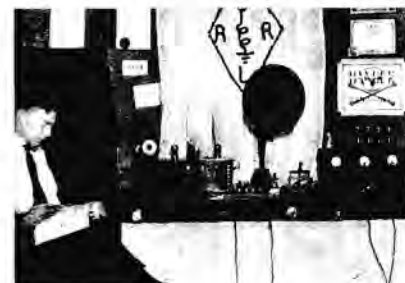
## AMATEUR RADIO STATIONS

(Concluded from page 48)

### 4BV, Loreburn, Sask.

4BV is not on the air at present but will be remembered by hundreds of amateurs as one of the first successful Canadian amateur stations in the West.

It was in December of 1920 that the "Yankee Rock Crusher" first pounded in on a famous old style audion tube at this station. The first attempt to transmit was made shortly afterwards with a Ford coil. Gradually the set was added to until in its final form it consisted of a single



circuit tuner and two stages of audio amplification. A C.W. set was installed and enlarged upon until the capacity of the plate generator was reached at three 5-watt tubes.

The transmitter, as operated all of last year, used three 5-watt tubes in a reversed feedback circuit with a maximum antenna current of 2.8 amperes when the batteries that furnished the power supply were on charge. The normal working antenna current was about 1.5 amperes. Power was supplied by a 32-volt Fairbanks-Morse farm lighting plant. The antenna system was a four-wire inverted L, seventy feet high at each end. A nine-wire circular counterpoise was used.

4BV holds some good records. The first cards and letters came from the U. S., then old 6ZAC reported signals QSA in Honolulu. A little later 4BV was the only Canadian station to be reported as heard by Mr. Steel at Invercargill, New Zealand. This latter distance is about 8500 miles. At the time 4BV was closed its DX record represented 6 provinces, 36 states, and a number of ships at Sea. 4BV's piping signals were constantly reported up and down the east and west coast throughout the radio season.

HOW DO YOU LIKE THE AMOUNT OF GOOD DOPE IN THIS ISSUE, FELLOWS?



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Pensez aux avantages d'être membre de la Ligue Canadienne de la Radio Amateur (CRRL) : abonnement aux publications mensuelles **QST Canada** et/ou **QST**, **service gratuit de QSL vers l'étranger** et **réductions** sur les livres et produits de CRRL, ARRL et RSGB. Grâce à votre cotisation, nous pourrions continuer à servir les radioamateurs canadiens **en les représentant auprès du ministère des Communications** et d'autres organismes gouvernementaux, ainsi que sur **la scène internationale**, et en mettant sur pied des réseaux servant l'intérêt commun, pour ne nommer que ceux-là. **Devenez membre de la Ligue.** La radio amateur canadienne et vous en sortirez **gagnants!**

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